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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/696,994	10/30/2003	Matthew T. Currie	ASC-063	7878

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EXAMINER	
BREWSTER, WILLIAM M	
ART UNIT	**PAPER NUMBER**
2823	

DATE MAILED: 08/18/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/696,994	CURRIE ET AL.	
	Examiner	Art Unit	
	William M. Brewster	2823	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *01 August 2005*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-26* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-26* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Drawings

The drawings were received on 1 August 2005. These drawings are acceptable for examination.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1-6, 11-15, 18-20, 22-23 are rejected under 35 U.S.C. 102(e) as being anticipated by Henley et al., US Publication No. 2001/0026997 A1.

Henley anticipates method for forming a semiconductor structure, the method comprising: in figs. 1A-2 and commensurate explanation,

in fig. 1B, forming a strained semiconductor layer 103, p. 3, ¶ 26, over a substrate 10, p. 2, ¶ 19;

in fig. 1C, depositing a screening layer 105 over at least a portion of a top surface of the strained semiconductor layer, pp. 2-3, ¶ 27; and

in fig. 2, introducing dopants 201 into the semiconductor structure through the screening layer, p. 4, ¶ 28;

limitations from claim 2, the method of claim 1 wherein the substrate comprises at least one of silicon and germanium, p. 2, ¶ 20;

limitations from claim 3, the method of claim 1 wherein the strained semiconductor layer is tensilely strained, p. 3, ¶ 26;

limitations from claim 4, the method of claim 3 wherein the strained semiconductor layer comprises tensilely strained silicon or tensilely strained silicon-germanium alloy, p. 3, ¶ 26;

limitations from claim 5, the method of claim 1 wherein the strained semiconductor layer is compressively strained, p. 3, ¶ 26;

limitations from claim 6, the method of claim 5 wherein the strained semiconductor layer comprises compressively strained germanium or compressively strained silicon-germanium alloy, p. 3, ¶ 26;

limitations from claim 10, the method of claim 7, wherein the thickness of the strained semiconductor is substantially unchanged following the deposition of the screening layer, wherein Henley does not state, imply, nor is any physical or chemical reason why the screening layer would by changed;

limitations from claim 11, the method of claim 1 wherein the substrate comprises an insulating layer disposed underneath the strained semiconductor layer, silicon-on-insulating layer, p. 2, ¶ 18;

limitations from claim 12, the method of claim 1 wherein the substrate comprises a relaxed semiconductor layer disposed underneath the strained semiconductor layer, part of the silicon wafer, p. 2, ¶ 19;

limitations from claim 13, the method of claim 12 wherein the substrate further comprises a compositionally graded layer disposed underneath the relaxed semiconductor layer, p. 4, ¶ 32;

limitations from claim 14, the method of claim 13 wherein the graded layer comprises at least one of a group II, a group III, a group IV, a group V, and a group VI element: group IV, p. 3, ¶ 26;

limitations from claim 15, the method of claim 14 wherein the graded layer comprises at least one of silicon and germanium, p. 3, ¶ 26;

limitations from claim 18, the method of claim 1 wherein the step of depositing the screening layer comprises chemical vapor deposition, pp. 3-4, ¶ 27;

limitations from claim 19, the method of claim 1 wherein the screening layer comprises an oxide layer, p. 4, ¶ 28;

limitations from claim 20, the method of claim 19 wherein the screening layer is selected from the group consisting of: silicon dioxide, silicon oxynitride, silicon germanium oxide, and germanium oxide: silicon dioxide, oxide from a silicon layer, p. 4, ¶ 28;

limitations from claim 22, the method of claim 1, wherein the screening layer affects the introduction of dopants into at least a portion of the structure by at least one of scattering dopants and reducing energy of the dopants, wherein the

'sufficient kinetic energy' proffers evidence to the effect of the screening layer, p. 3, ¶ 21;

limitations from claim 23, the method of claim 22, further comprising: subjecting the structure to a thermal anneal, wherein the screening layer hinders out-diffusion of the dopants from at least a portion of the substrate, wherein the screening layer, as any material, hinders out-diffusion, p. 3, ¶ 22.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 7-10, 16-17, 21, 24, 25, 26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Henley as applied to claims 1-6, 11-15, 18-20, 22-23 above, and further in view of Bhattacherjee et al., US Patent No. 4,764,248.

Henley does not specify growing an oxide prior to the screening layer or using rapid thermal oxidation (RTO), but Bhattacherjee does. Bhattacherjee teaches prior to depositing an additional layer, in fig. 3A, growing an oxide layer 22, over the portion of the top surface of the semiconductor layer 21, grown by rapid thermal oxidation, in col. 8, lines 3-35. It would have been obvious to a person of ordinary skill in the art at the

time the invention was made to recognize that combining Bhattacherjee's process with Henley's invention would have been beneficial because it ensures controllability and short thermal time of the formation of the oxide for a more robust doping inhibitor.

For claims 7-9, Henley does not specify the strained layer thickness; for claims 16-17, the concentration of the germanium or the thickness of the graded layer; for claim 21, the thickness of the screening layers, or for claim 26, the thickness of the oxide layer, however the practitioner may optimize this dimension.

"Normally, it is to be expected that a change in temperature, or in concentration, or in both, would be an unpatentable modification. Under some circumstances, however, changes such as these may impart patentability to a process if the particular ranges claimed produce a new and unexpected result which is different in kind and not merely degree from the results of the prior art . . . such ranges are termed 'critical ranges' and the applicant has the burden of proving such criticality . . . More particularly, where the general conditions of a claim are disclosed in the prior art, it is not inventive to discover the optimum or workable ranges by routine experimentation."

In re Aller 105 USPQ 233, 255 (CCPA 1955). See also In re Waite 77 USPQ 586 (CCPA 1948); In re Scherl 70 USPQ 204 (CCPA 1946); In re Irmscher 66 USPQ 314 (CCPA 1945); In re Norman 66 USPQ 308 (CCPA 1945); In re Swenson 56 USPQ 372 (CCPA 1942); In re Sola 25 USPQ 433 (CCPA 1935); In re Dreyfus 24 USPQ 52 (CCPA 1934).

Note that the specification contains no disclosure of either the critical nature of the claimed dimensions of any unexpected results arising there from. Where

patentability is aid to be based upon particular chosen dimensions or upon another variable recited in a claim, the Applicant must show that the chosen dimensions are critical. In re Woodruff, 919 F.2d 1575, 1578, 16 USPQ2d 1934, 1936 (Fed. Cir. 1990).

Other Prior Art

In the response of 1 August 2005, applicant stated for the record that the following prior art was commonly assigned at the EFD of the current application to the same assignee: Vinels, US Publication No. 2004/0040493; Lochtefeld, US Publication No. 2004/0031979; Lochtefeld, US Patent No. 6,838,728; Currie, US Patent No. 6,831,292; Hammond et al., US Patent No. 6,680,496.

Response to Arguments

Applicant's arguments with respect to claims 1-26 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to William M. Brewster whose telephone number is 571-272-1854. The examiner can normally be reached on Full Time.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Matthew Smith can be reached on 571-272-1907. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

William M. Brewster

15 August 2005
WB